





AFTERNOON SESSION

Welcome: John Ciovacco, Conference Co-Chair / NY-GEO

Gold Sponsor Remarks: John Thomas / WaterFurnace

Gino Di Rezze/ Groundheat

National Update: Jeff Hammond / IGSHPA

Ryan Dougherty / GeoExchange

NY-GEO Review: Bill Nowak, Legislative Update / NY-GEO

Christine Hoffer, NY-GEO Review

Afternoon Keynote: KEYNOTE: Alexis McKittrick / Geothermal Technologies Office U.S. Department of Energy



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Smarter from the Ground Up™





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GEOTHERMAL PIONEERS......SINCE 1985







National Update:



Jeff Hammond
Executive Director
IGSHPA



Ryan Dougherty
President
GeoExchange Organization







NY-GEO Update:



Christine Hoffer
Executive Director
NY-GEO



Bill Nowak
NY-GEO BOD
Legislative Review



NY-GEO Policy Priorities



Ongoing...

- Drilling Deeper Than 500'
- NENY \$5 B EE & Electrification 4/12
- Con Edison Select Pricing
- Thermal Energy Networks
- Geo as Storage Saves the Electric Grid

Need your help today!

- NY Tax Credit Refundable & \$10k
- NY HEAT Act Reduce Gas Subsidies



NY-GEO Policy Priorities



Geo Tax Credit – Refundable & \$10k

Email at: Bit.ly/geotax

NY HEAT Act — Reduce Gas Subsidies

Email at: Bit.ly/nyhe

 Call Assembly Speaker Carl Heastie (sounds like Hasty)

518-455-3791

Business support memo – billnowa@gmail.com



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NYSERDA





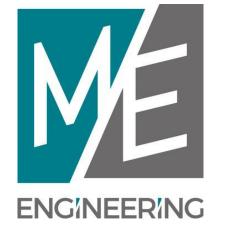


































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Geothermal Drilling Solutions LLC

GTD Group

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LaBella Associates

Morris Industries, Inc.

National Compressed Air Canada ltd

National Grid

NYS DPS

Phoneix Energy Supply

RJ Murray

Rototec LLC

Stark Tech

The Driller Podcast

UA Local 7 Plumbers/Steamfitters

Waterless Geothermal







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NY-GEO HISTORY 10 YEARS - 2014

- 2014 01 25 Call re getting the geo industry organized in NY
- 2014 02 13 Original NY-GEO conference organized through Phoenix Energy as the prime upstate gshp distributor
- 2014 02 21 and 28 NY-GEO organizing phone meetings
- 2014 04 25 1st NY-GEO 3:00 PM Friday call
- 2014 05 05 Diane Burman (probably the same date we met with National Grid and with John Rhodes head of NYSERDA and Audrey Zibelman head of the PSC)
- 2014 06 23 NY-GEO legal formation meeting
- 2014 06 18 Call with Pete Sheehan from the Department of Public Service
- 2014 06 18 call w Bob Wyman on geo financing
- 2014 07 14 NY-GEO interim board 1st meeting



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FOUNDING MEMBERS

John Abularrage, Advanced Radiant Design, Inc.

Roger Anthony, Anthony's Heating and Contracting

Keith Bell, Bell HVAC

Philip Blatner, Capital Heat Inc.

Bryan Bourque, Bourque Mechanical Systems, Inc.

Edward Byrne, Paradise Heating and AC, LLC

Peter Cann, Cann Geothermal Plus

Joseph Carey, Choice Heating and Cooling, LLC

Garrett Carrino, American Well & Pump Co

John Ciovacco, Aztech Geothermal

Daniel Cochran, Renaissance HVAC

Donald Colbert II, Freedom Mechanicals, LLC dba

Cornerstone Services

Roger Connelly, Geo Tech Climate Control

Brett Conyer, Integrated Geothermal, LLC

Jesse Cook, Geotherm, Inc.

Sam Cosamano, IPD Engineering

Steven Couse, Earth Energy Connections Inc

David Cramer, Zoe Energy Solutions Inc.

Ryan Dailey, Dailey Electric Inc

Adam DeVit, Thermal Associates

John B. DeVitt, Advanced Thermal Technologies

Doug Dougherty, The Geothermal Exchange

Organization (GEO)

John (Jack) P. DiEnna, Jr., Geothermal National &

International Initiative

Josh Einbinder, NY GreenTech

Bill Feldmann, Empire Clean Energy Supply

Zachary Fink, ZBF Geothermal, LLC

Brad Fisher, Friedman Fisher Associates, P.C.

Tim Foley, Foley Mechanical, Inc.

Tamar Fox

John Franceschina, PSEG Long Island

Mike Goekbora, GeoThermal Tools, Inc.

Donovan Gordon, D. Gordon Consulting, Inc.

Peter Grill, Meadowlands Geothermal

Lloyd Hamilton, Verdae, LLC

Geoffrey Hanowitz, Woodstock Plumbing Heating AC,

LLC

Jonathan M. Harkness, EBM Consulting Services

AJ Heiligman, Alternative Carbon Energy Systems, Inc.

Allen Hicks, Energy Efficiency Consultants LLC

Robert Jensen, Agreenability

Lori Kempf, Suffolk Systems Inc.

Dale La Quay, Diversified Energy System Installations

Harshad Lakhani, Lakhani & Jordan Engineers

Charles Lazin, Altren Consulting & Contracting, Inc.

John Lembo, TRC Energy Services

John Manning, Phoenix Energy Supply

Joe Miranda, Aquifer Drilling & Testing Inc.

Jim Moench, Geothermal Services, Inc.

Jesse Monette, Blake Equipment

Kevin Moravec, Moravec Geothermal

Paul Moshano, PM Innovations

James Murray, Greenway Energy Solutions Inc.

Brian Nodine, Nodine's Heating

Zachary Nothnagle, Nothnagle Drilling

Bill Nowak, Buffalo Clean Energy

Kevin O'Rourke, O'Rourke Groundwater Developing, LLC

Joe Parsons, EarthLinked Technologies, Inc.

Tony Penachio, GeoColumn HX

Tom Piekunka, Piekunka Systems Inc

Jens Ponikau, Buffalo Geothermal Heating

Nicholas Pryputniewicz, NP Environmental, LLC

Lynette Raimondi, AP Plumbing

Len Rexrode, Aquifer Drilling & Testing Inc.

John Rhyner, PW Grosser Consulting

Billii Roberti, Green Choices Consulting

Jeff Rosenberg, Geothermal Energy of Oneonta, Inc.

Chuck Russo, Chuck Russo Heating & A/C, LLC

Bennett Sandler, Equity Energy

Amanda Schneck, WaterFurnace

John Schretzmayer, Associated Environmental Services, Ltd

Dan Silvestri, D. Silvestri Sons Inc.

Hal Smith, Halco Energy

James Snyder, Snyder Manufacturing, Inc.

Steve Tallman, Tag Mechanical

Bill VanHee, Van Hee Mechanical

Mike Veeder, Kool-Temp Heating & Cooling





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MEMBERSHIP - MAXIMIZE IT!

- Working groups
- Utilize the website
- Maximize your listing
- Post your job openings
- Share your news & events
- Conferences:
 - Sponsor → Exhibit → Attend





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NYSERDA

- Grow Membership
- Grow Geothermal Installs
- Grow GSHP Sales
- Grow Workforce





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ACT - ADVOCACY COMMUNICATION TASKFORCE

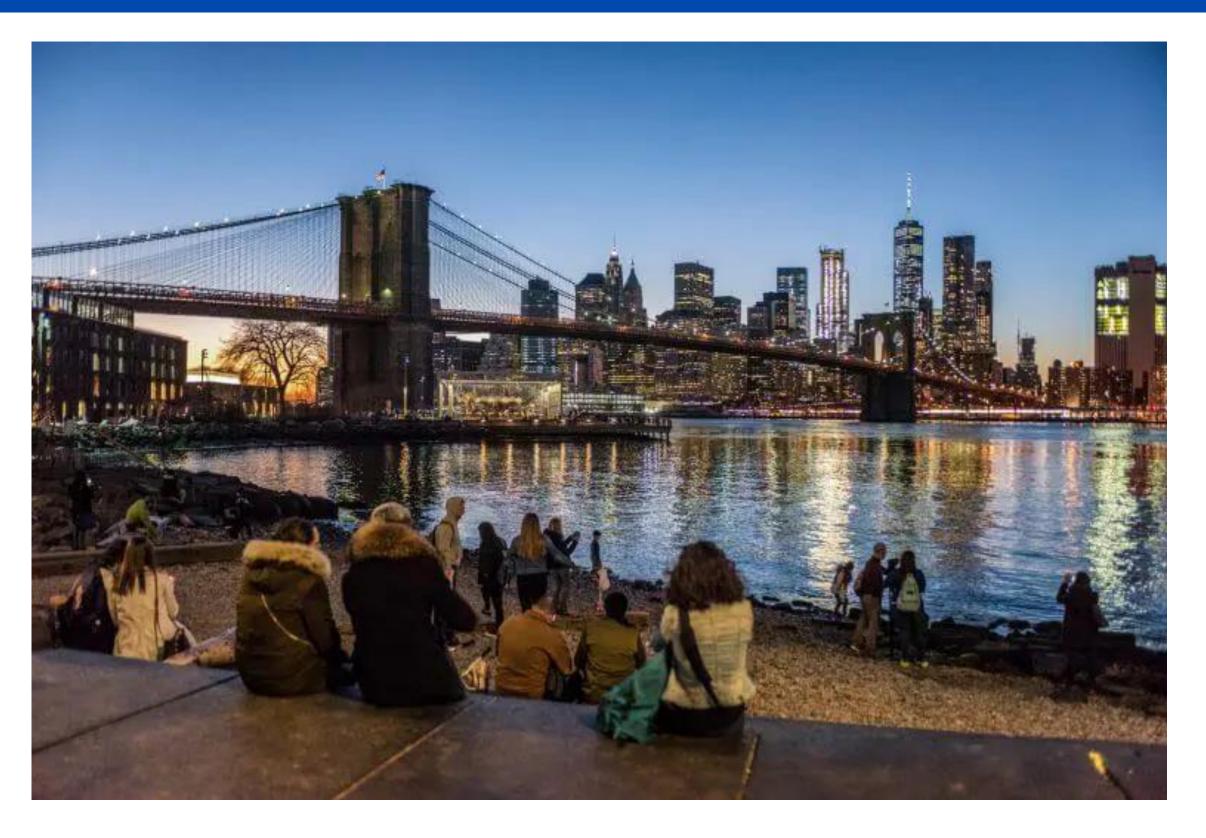
Launched first initiative - National Geothermal Month April





NY-GEO 2024 OCTOBER 21-23 | BROOKLYN





Join Us

All registered attendees to receive a special code to use within 30day!



NY-GEO 2024



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Alexis McKittrick, Ph.D.,
Program Manager Low Temperature
Geothermal, U.S. Department of Energy



Office of ENERGY EFFICIENCY & RENEWABLE ENERGY

Geothermal Technologies Office: Pumped Up about Geothermal Heat Pumps

Alexis McKittrick, PhD

Program Manager, Low Temperature and Coproduced Resources





GTO aims to increase <u>all</u> geothermal energy deployment through research, development, and demonstration of innovative technologies that enhance exploration and production.



Enhanced Geothermal Systems



Hydrothermal Resources



Low Temperature and Coproduced Resources



Data, Modeling, and Analysis



DOE and the Administration are Pumped about GHPs!



Impacts Report highlighting the significant value of GHPs as a grid cost reduction and decarbonization technology



Funding multiple projects across the country



Supporting heat pump manufacturing



Providing tax incentives



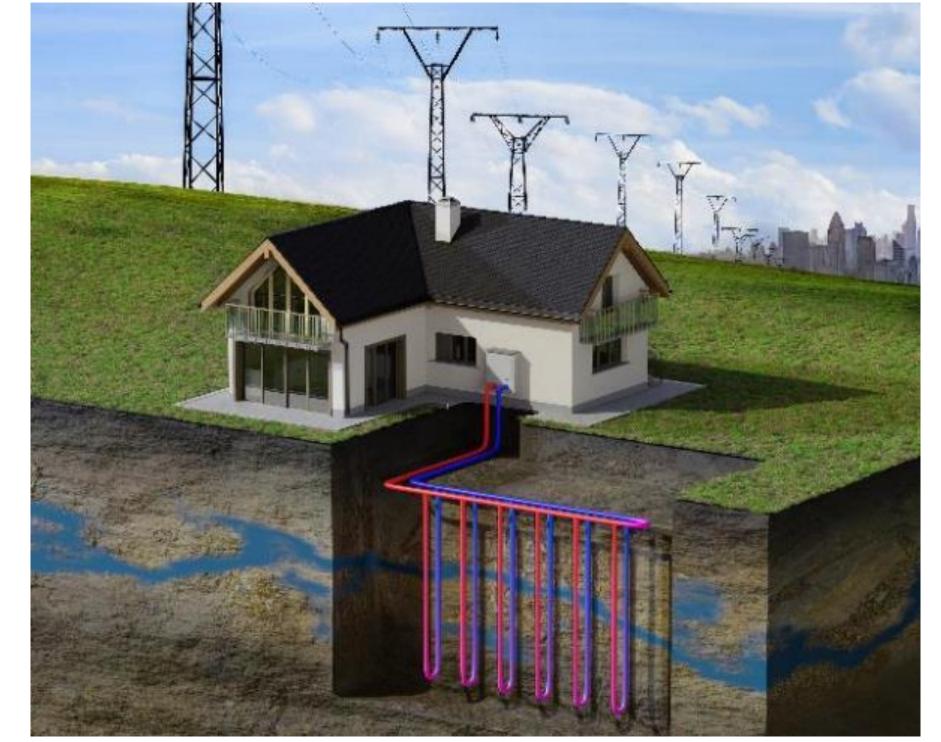
Creating educational resources and sharing the news about how the many benefits of GHPs!



GTO-funded analysis by Oak Ridge National Lab and National Renewable Energy Lab to assess how mass deployment of geothermal heat pumps (GHPs) can provide cost and

carbon reductions at the grid.

- Aimed to quantify:
 - Effects on building electricity use and emissions resulting from mass deployment of GHPs
 - Impacts to the bulk power system under various carbon policy, electrification, and sensitivity scenarios.





GHP Impacts Report: Modeled Scenarios Through 2050

Base Scenario

No national carbon policy

Grid Decarb Scenario

95% grid emissions reduced by 2035

100% grid emissions reduced by 2050

Grid + Economy Decarb Scenario

95% grid emissions reduced by 2035

100% grid emissions reduced by 2050

+

Partial economy-wide electrification of end uses

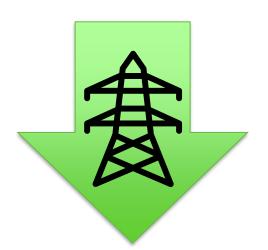
Each scenario modeled with and without mass GHP deployment assuming:

- 100% eligible GHP retrofit + new residential and commercial buildings
- Linear GHP deployment rate to 100% from 2020 to 2050

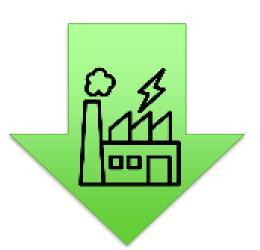
https://www.osti.gov/biblio/2224191



GHP Impacts Report: A Really Big Deal!



Eliminate the need for up to 43,600 miles of new interregional transmission infrastructure – equivalent of up to 44 SunZia transmission projects



Reduce up to 410 GW of nationwide generation capacity requirements – bolstering seasonal U.S. grid resilience



Eliminate more than 7 gigatons of carbon – equivalent to all U.S. emissions produced in 2022



GHP Impacts Report: Next Steps

- Phase II work to assess and quantify how:
 - GHP adoption aligns with the Administration's <u>Justice40</u>
 Initiative
 - GHPs can accelerate the U.S. clean energy workforce transition
 - GHPs can provide a path forward for natural gas distribution utilities in a decarbonized future.

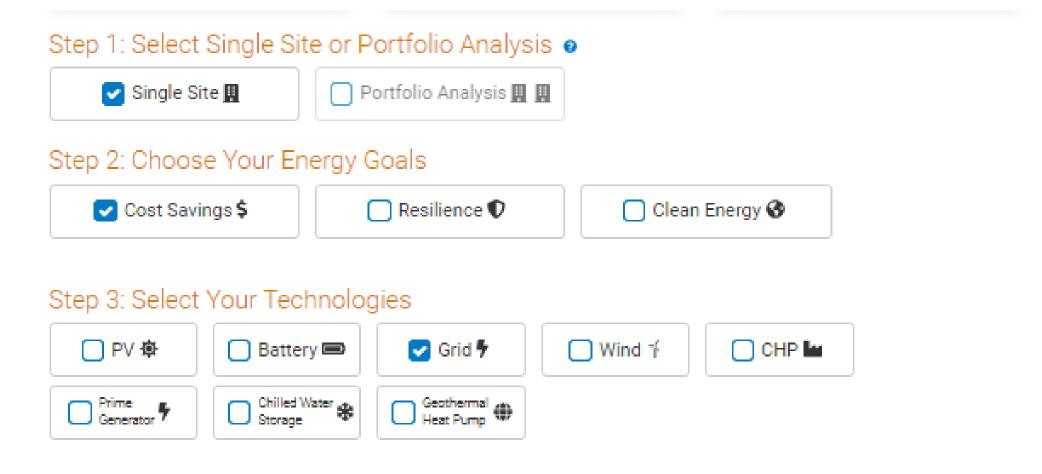


EERE's Alejandro Moreno and GTO's Alexis McKittrick, Sean Porse, and Jeff Winick discuss the new GHP impacts report at the 2023 International Ground Source Heat Pump Association (IGSHPA) Annual Conference. Photo Credit: Bryce Carter

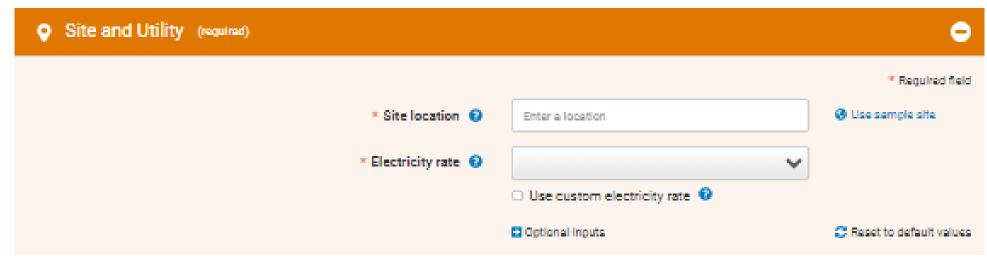


New feature in NREL's **REopt** web tool allows users to compare GHP and hybrid geothermal heat exchange systems using information like system size, intended use, and current energy costs to identify optimally-sized heating and cooling solutions

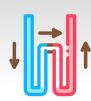




Step 4: Enter Your Site Data



https://reopt.nrel.gov/



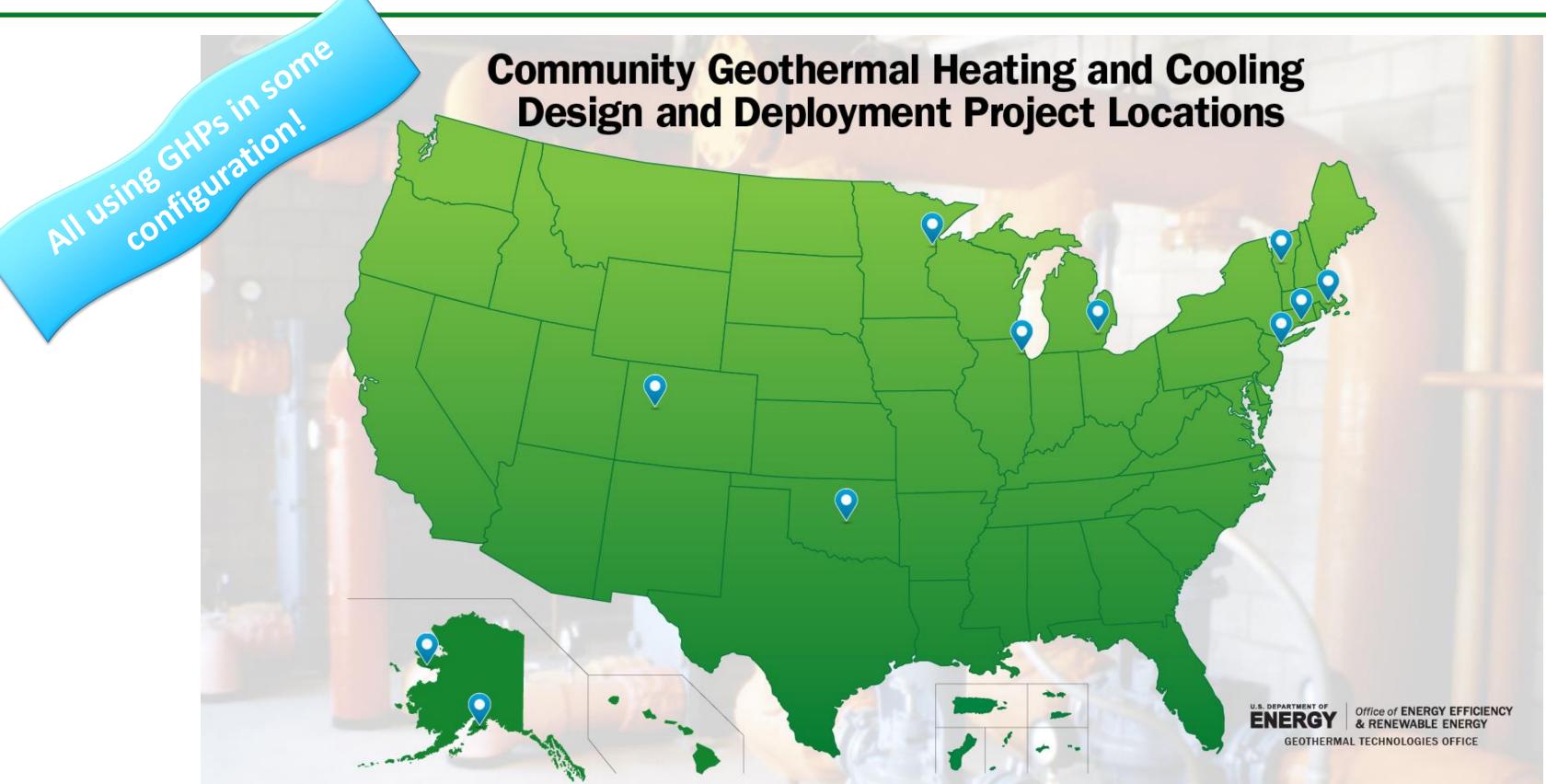
Community-Focused Geothermal

- Deploy new or retrofitted geothermal or geothermalhybrid heating and cooling systems in U.S. districts, neighborhoods, and communities
- Identify solutions for environmental justice conditions
- Assist U.S. communities to develop career and technical education and workforce transition
- Develop U.S. case studies about projects, including technical and economic data, to illustrate how projects can be replicated
- Publish data and information about U.S. geothermal district heating and cooling system deployment.





† Community-Focused Geothermal



energy.gov/eere/geothermal/community-geothermal-heating-and-cooling-design-and-deployment



Community-Focused Geothermal: Urban/Suburban

- Ann Arbor, MI (Lead: City of Ann Arbor)
 - 5th-gen system to cover at least 75% of heating and cooling loads for low-income households and public/city buildings
- Chicago, IL (Lead: Blacks in Green™)
 - 5th-gen system with modular approach for >100 multi-family and single-family residential buildings
- Duluth, MN (Lead: City of Duluth)
 - 4th-gen system with waste heat from local wastewater treatment captured





Community-Focused Geothermal: Urban/Suburban

- Framingham, MA (Lead: Home Energy Efficiency Team)
 - 5th-gen utility-managed system to meet 100% of the heating and cooling needs of the connected buildings
- New York City, NY (Lead: Electric Power Research Institute)
 - 4th- or 5th-gen integrated systems to serve apartments identified for geothermal upgrades
- Wallingford, CT (Lead: CT Department of Energy and Environmental Protection)
 - 5th-gen system to serve at least 50% of heating and cooling loads of an affordable housing complex



energy.gov/eere/geothermal/community-geothermal-heating-and-cooling-design-and-deployment



Community-Focused Geothermal

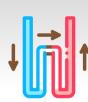


RURAL COMMUNITIES

- Carbondale, CO (Lead: Clean Energy Economy for the Region)
 - 5th-gen system to supply at least 25% of the heating and cooling needs for a mix of public and residential buildings
- Middlebury, VT (Lead: GTI Energy)
 - GHP system to provide heating and cooling to a 100-home affordable housing development
- Seward, AK (Lead: City of Seward)
 - 4th-gen heat pump system to <90% of heating demand for half of City buildings
- Shawnee, OK (Lead: University of Oklahoma)
 - Hybrid solar-geothermal system to provide heating and cooling to a community owned and operated by a Tribal Nation

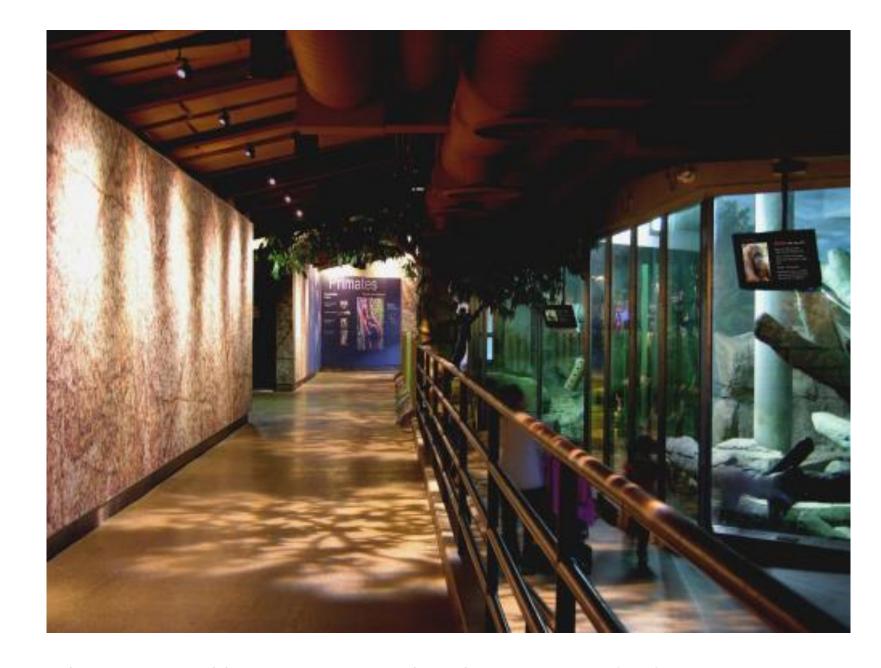
REMOTE/ISLANDED COMMUNITY

- Nome, AK (Lead: Kawerak, Inc.)
 - Direct-use space heating and food storage cooling system



Como Zoo and Conservatory, St. Paul, MN

- <u>Congressionally-Directed Project</u> to replace existing natural gas steam boiler heating in the Primates Building with a GHP
 - Follows a feasibility study by the Zoo, the city,
 Xcel Energy, and a local geothermal company
 - Expected to reduce emissions by up to 50% and reduce facility operating costs so more resources can be used to enhance programs that serve the community
- After completing the Primates Building project, the zoo hopes to raise nearly \$8M to install geothermal in the visitors center and the main zoo building.



The Primate Building at Como Zoo. Photo by Museum Technology Source, Inc.



- <u>Congressionally-Directed Project</u> to create a district energy system for four city buildings
- Features Twin Cities-based startup's heat-pump technology, <u>developed at the University of</u> <u>Minnesota</u>, that taps aquifers and uses <u>fewer</u>, shallower wells
 - Replaces steam line that is at end of useful life
 - Expected to reduce operational cost for public building operations and improve reliability and safety for core community services (currently no back-up system)
- System design will allow additional renewable components in the future if desired



Rochester, MN city buildings that will initially be served by the geothermal district energy system. Rendering from <u>Minnesota House of Representatives</u>.



Small Business Innovation Research (SBIR) Studying GHPs

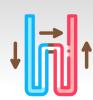
Mainstream Engineering Corporation

Phase 2: Advanced Energy Storage Topic

Looking at coupled solar-geothermal storage systems (CSGSS)

- Uses solar-thermal collectors to provide domestic hot water and heat the ground
- Increases heat-pump efficiency
- Provides nearly carbon- and electricity-free hot water
- Will decrease initial cost of ownership for both GHPs and solar-thermal hot water systems, while also reducing monthly electrical bills.





Small Business Innovation Research (SBIR) Studying GHPs

Darcy Solutions, Inc.

Phase 2: Advanced Energy Storage Topic \$1.1M

- New, innovative GHP technology to allow for thermal energy storage in shallow reservoirs (advective GHP)
- Changes the way heat is transferred with the shallow subsurface
- AGHP modeled and tested successfully in Phase I
- Phase II to include a larger field test
- Multiwell AGHP system will be tied to a building or series of buildings to provide thermal energy storage and recovery for 912 months (~2 ½ years)

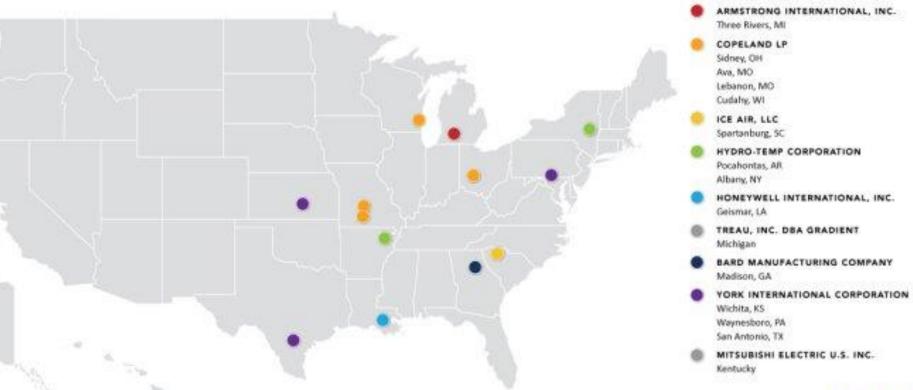




Heat Pump Manufacturing

- Nine projects <u>selected</u> to receive up to \$169 million to accelerate electric heat pump manufacturing at 15 sites in 13 states
- First awards from DOE's authorization to use the Defense Production Act to increase domestic production of five key clean energy technologies, including ground-source (geothermal) and air-source electric heat pumps.
- Two projects that include geothermal heat pumps:
 - Ice Air, LLC, Spartanburg, SC
 - Hydro Temp Corporation, Pocahontas, AR and Albany, NY

MESC Selectees for Heat Pump Manufacturing







Heat Pump Manufacturing Funding Opportunity

- \$63 million available in <u>second round of</u> <u>funding</u> to accelerate electric heat pump manufacturing
- Part of DOE's authorization to use the Defense Production Act to increase domestic production of five key clean energy technologies, including geothermal and airsource electric heat pumps
- Builds on a first round of \$169 million in selections in November 2023, including two geothermal heat pump manufacturers
- Concept papers required and due March 15
- Full applications due April 29.



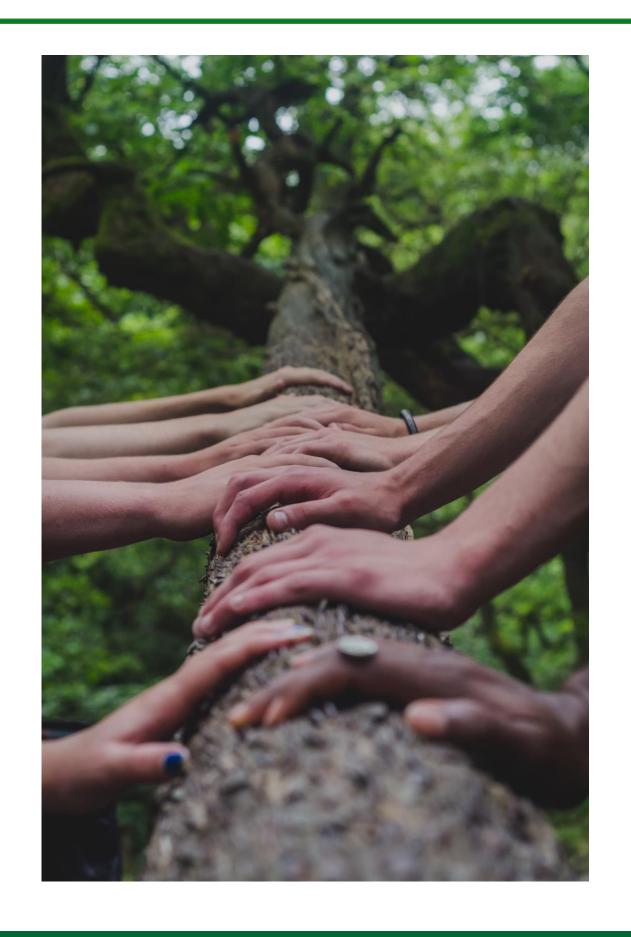
GHP system at NOAA's Caribou Weather Forecast Office in Maine. Photo courtesy John Porter / NREL pix 12708.

energy.gov/mesc/office-manufacturing-and-energy-supply-chains



*Communities Sparking Investment in Transformative Energy (C-SITE)

- \$18 million available in financial awards and technical assistance to advance community identified energy priorities
- Funded by DOE's Office of State and Community Energy Programs' (SCEP) Local Government Energy Program
- Numerous technology areas eligible, including building efficiency and/or electrification, energy infrastructure upgrades, microgrids, renewable energy, resilience hubs, and workforce development
- Applications due May 31.





GHPs in the Inflation Reduction Act

Residential

 30% tax credit for ENERGY STAR-rated GHPs through 2032

Commercial:

- Investment Tax Credit for renewable energy projects beginning construction before 1/1/25. For geothermal, the base investment tax credit is 6% for the first 10 years, scaling to 5.2% in 2033 and 4.4% in 2034.
- Credit increases for projects meeting prevailing wage and registered apprenticeship requirements; certain domestic content requirements for steel, iron, and manufactured products; and/or if located in an energy community.

OFFICE OF ENERGY EFFICIENCY & RENEWABLE ENERGY



Installing GHP pipes for residential housing in South Carolina. Photo by Belton Tisdale. NREL pix 12372



Fall 2023 Geothermal Collegiate Competition (GCC)



Fall 2023 winning projects include:

- Ocean-based closed-loop GHP heating and cooling system in Elim, AK (Columbia/Princeton)
- Direct-use system for Osage Nation greenhouse (Univ. of Oklahoma)
- GHP system on a brownfield site to provide heating and cooling for ~2,800 residents (UC San Diego)
- GHP system to meet heating and cooling needs for a university musical and performance arts hub





energy.gov/eere/geothermal/geothermal-collegiate-competition



GHP and Geothermal Resources!

GTO uses multiple tools and resources to provide education about geothermal energy,

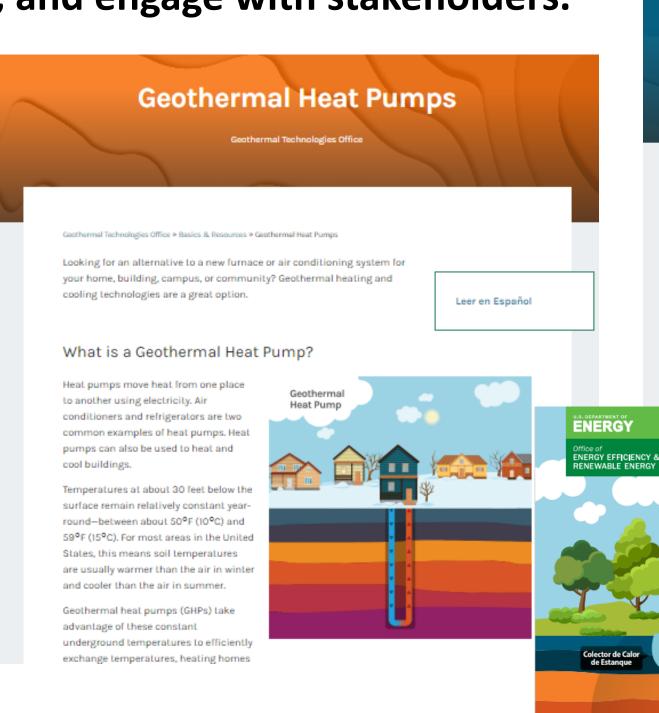
communicate funding opportunities, and engage with stakeholders.

- **GHP Info Page**
- GHP Info Page in Spanish
- **GHPs for Consumers Page**
- GHPs for Consumers Page in Spanish
- **GHP Fact Sheet**

U.S. DEPARTMENT OF ENERGY

- GHP Fact Sheet in Spanish
- The Drill Down Newsletter
- **Funding Opps Webpage**

geothermal.energy.gov



Geothermal Heat Pump Information for Consumers Geothermal Technologies Office

Geothermal heat pumps (GHPs) offer an efficient solution for heating and cooling buildings, but navigating applicable tax credits or grants and finding local installers can be difficult for consumers. To ease the search for GHP assistance, the Geothermal Technologies Office (GTO) put together a list of resources below to help consumers interested in installing a GHP for a home or business.

What is a geothermal heat pump?

GHPs take advantage of the constant temperature of the shallow earth (40-70°F/4.5-21°C) to efficiently exchange temperatures, heating homes in the winter and cooling homes in the summer. Rocks and soils provide thermal energy storage, which allows GHPs to act as a heat sinkabsorbing excess heat during summer, when surface temperatures are relatively higher-and as a heat source during the winter, when surface temperatures are lower. This increases efficiency and reduces the energy consumption of heating and cooling for residential and commercial

Qué son las Bombas de Calor Geotérmicas?



otro utilizando electricidad. Un aire acondicionado y un refrigerador son dos ejemplos comunes de oombas de calor. Las bombas de calor también pueden utilizarse para calentar y enfriar edificios.

Las bombas de calor geotérmicas (GHP) utilizan las temperaturas constantes del subsuelo para intercambiar temperaturas de forma eficaz.

Leer en Español

Want a quick guide on

how GHPs work?

Download our fact

Thank You!





Get the hottest geothermal news from *The*

Drill Down, GTO's monthly newsletter!

Sign up today:

geothermal.energy.gov

Interested in serving as a merit reviewer for

GTO RD&D projects?

Questions?

The **Geothermal Technologies Office (GTO)** works to reduce the cost and risk associated with geothermal development by supporting innovative technologies that address key exploration and operational challenges.

Visit our website at energy.gov/eere/geothermal or by scanning the QR code.





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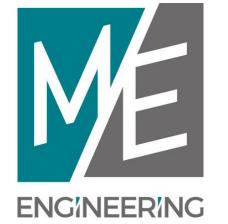






























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